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PALMER

DEVELOPING MOUNTAIN BIKE (NON-MOTORIZED) OPPORTUNITIES
ON THE PISGAH RANGER DISTRICT

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ABSTRACT

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TITLE: Developing Mountain Bike (non-motorized) Opportunities on the
Pisgah Ranger District

ABSTRACT: Since 1988 the demand for mountain biking opportunities has increased dramatically on the Pisgah Ranger District. In fact the Nantahala/Pisgah Forest and Land Management Plan approved in 1987 did not consider mountain biking as a recreational opportunity because there was virtually no existing use. Since that time, North Carolina has appeared in various bicycle magazines "as the place to go for a high quality mountain biking experience". In response to this demand the Pisgah Ranger District completed a trail management plan in 1990. This plan provides over 200 miles of trails, closed roads, and abandoned railroad grades where mountain bikes are currently allowed. Many of these opportunities are now occurring on previously hiker-only trails. This paper, through the use of visitor questionnaires and field monitoring of resource and safety conditions over a 5-year period (1990-1995), will address the environmental, social, and safety concerns and considerations of combining these trail uses. The final product will include a pocket guide for land managers to be used in planning and monitoring mountain bike opportunities, primarily on previously hiker only trails.

Keywords: Mountain Bikes; Environmental, Social, and Safety Concerns.

TABLE OF CONTENTS

Executive Summary	1
CHAPTER	
I. Introduction.....	2
Statement of Purpose	2
II. Literature Review	3-4
III. Methodology	5
Planning and Inventory.....	5
Environmental Concern Monitoring.....	5-6
Safety Concern Monitoring.....	6
Social Concern Monitoring.....	7
IV. Discussion	8
Environmental Concern Monitoring.....	8-9
Safety Concern Monitoring.....	9
Social Concern Monitoring	9-10
V. Summary	11
Recommendations.....	11
Conclusions.....	12
Literature Cited	13
Appendix	A-F
Trail Condition Monitoring Form (Environmental Concerns).....	A
Safety Monitoring Forms for Multiple Use Trails (Safety Concerns).....	B
Trail Visitor Accident or Complaint Documentation Form.....	B
Trail Visitor Questionnaires.....	C
Mountain Bike Planning Guide (FSM).....	D
Mountain Bike Code of Ethics.....	E
Annual Monitoring Update/Summary Form.....	F

EXECUTIVE SUMMARY

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Summary:

Since 1988 the demand for mountain biking opportunities has increased dramatically on the Pisgah Ranger District. In response to this demand the District completed a Trails and Dispersed Recreation Management Plan in 1990. This plan allocated over 200 miles of trails, closed roads, and abandoned railroad grades to mountain bike use. Thirteen of these trails were previously designated as hiker-only. The decision to permit mountain bike use on these trails has caused many historic users to be concerned. In response to their concerns and the Districts need to verify the decisions made, we incorporated mitigating measures into this plan which require monitoring of the environmental, safety, and social effects of mountain bikes on previously hiker-only trails, the intent of this project.

The primary objectives of this project are to: (1) establish criteria which can be used to plan and monitor the environmental, safety, and social effects of mountain bikes on previously hiker-only trails; (2) develop user-friendly questionnaires and monitoring forms that can be used by all levels of the agency; (3) implement a 5-year monitoring program (1991-1995) to verify or modify the criteria; (4) determine the type of visitors using our trails, their expectations and experience level; (5) meet the monitoring requirements established in the district recreation plan; (6) publish the final product as a "Pocket Guide for Land Managers", to be used for planning and monitoring mountain bike opportunities, primarily on previously hiker-only trails.

Very little has been done historically to evaluate the environmental, safety, and social concerns associated with mountain bikes on previously hiker-only trails. Therefore, the evaluation criteria and monitoring forms created for this project will need time to be verified. This monitoring program will continue for a 5-year period (1991-1995). During this time the criteria established for each functional area (environmental, safety, and social) will be verified and/or modified. After the monitoring program is completed (1995), the final results will be used to complete a "Pocket Guide" which will be submitted along with the annual monitoring updates to the Southern Region, Trails Coordinator, for review and disbursement.

CHAPTER I

INTRODUCTION

Since 1988 the demand for mountain biking opportunities has increased dramatically on the Pisgah Ranger District. In fact, during the scoping process for the Nantahala/Pisgah National Forest Land Management Plan, approved in 1987, mountain biking was not identified as an issue, and therefore, not addressed in the forest plan. Since that time North Carolina has appeared in various bicycle magazines "as the place to go for a high quality mountain biking experience".

In response to this demand the Pisgah Ranger District completed a Trails and Dispersed Recreation Plan in 1990. This plan allocated over 200 miles of trails, closed roads, and abandoned railroad grades to mountain bike use. Approximately 13 trails (43 miles) allocated to mountain bike use are on previously hiker-only trails. The decision to permit mountain bike use on these trails has caused many historic users to be concerned. In response to their concerns and the Districts need to verify the decisions made we incorporated mitigating measures into this plan that requires monitoring the environmental, safety, and social effects of mountain bikes on previously hiker-only trails, the intent of this project.

The primary objectives of this project are to: (1) establish criteria which can be used to plan for and monitor the environmental, safety, and social effects of mountain bikes on previously hiker only trails; (2) develop user-friendly questionnaires and monitoring forms that can be used by all levels of the agency; (3) implement a five-year monitoring program to verify or modify the the criteria; (4) determine the types of visitors using our trails, their expectations and experience level; (5) meet the monitoring requirements established in the district recreation plan; (6) publish the final product as a "Pocket Guide for Land Managers", to be used in planning and monitoring mountain bike opportunities, primarily on previously hiker only trails.

The "Pocket Guide for Land Managers" will be the final product of this 5 year monitoring and verification program (1990-1995). This guide will include: (1) The mountain bike trail planning standards and guidelines from the Forest Service Trails Handbook; (2) The final Environmental, Safety, and Social Monitoring Forms which have been created and will be verified or modified through this project; (3) A check list for planning and monitoring the effects of mountain bikes on previously hiker-only trails; (4) Tips and recommendations learned through this project.

In addition, the results of our annual monitoring will be compiled and updated. This update will include: (1) the data and summary results of social monitoring through the visitor questionnaires; (2) Evaluation criteria and monitoring changes that have occurred; (3) Summary of the years monitoring activities including findings and recommendations.

CHAPTER II

LITERATURE REVIEW

Introduction

The fastest growing segment within the outdoor recreation equipment industry is the mountain bike. Sales are expected to reach 10 million by the end of 1990. This is approximately 80 percent of the entire bicycle sales in the country (Sloan, 1990). In fact, no model of bike has ever taken the U. S. market the way mountain bikes have (Foote, 1987). With this information available to land managers, it is amazing that so little has been done to research the effects of this use on our public lands.

Many articles in magazines such as Backpacker, Mountain Bike, Bicycling, Boy's Life, Field and Stream, American Forests, American Hiker, and others have printed articles addressing the issues surrounding mountain bike use. Few, however have evaluated the actual environmental, safety, and social effects of this activity. Most of the literature reviewed was either strongly supportive of or totally opposed to mountain bikes on hiking trails. Those who supported mountain biking talked primarily about the need for properly designed trails, promoting the existing code of mountain bike ethics, and stressing the need to be courteous to other trail users (Viehman, 1990; McCullagh, 1990). In most cases safety was the primary reason for opposing mountain bike use, although resource concerns were identified occasionally (Delves, 1987; Eugenis, 1985; Feldman, 1988).

In an exclusive survey of America's trail managers from federal and state public land agencies, the following results are noted regarding mountain bike access:

- * 56% of the respondents indicated that mountain biking is permitted on un-paved trails under their administration,
- * 47% indicated that most mountain bikers are well-behaved,
- * 68% did not encounter trail damage by mountain bikes.

When asked how their answers were determined, 89% indicated observation by employee or visitor, and only 11% used some type of study or scientific evidence (McCullagh, 1990).

The controversy over where mountain biking should and should not be permitted continues. The primary issues surrounding this controversy include the environmental, safety, and social effects of the activity. Each of these issues are discussed below.

Environmental Concerns Associated with Mountain Biking

Most of the literature reviewed concerning the environmental effects of mountain bikes was based on the issue of bicycle use in Wilderness. Since that issue has been resolved for the present time, and is not pertinent to this report, references will not be made. In reviewing literature pertaining to the environmental effects of mountain bike use on trails outside of Wilderness

areas opinions range from: mountain bikes cause the same problems as motorized dirt bikes (Locke, 1984), to it would take a hundred mountain bikes to do as much damage as one horse (Knize, 1987). With these conflicting opinions and little available research data (virtually none for the Southern National Forests) it is difficult to determine what the environmental effects of this use are. No information regarding documented resource damage by mountain bikes on previously hiker only trails was obtained through the requested literature search for this project.

Safety Concerns Associated with Mountain Biking

There is no question that mixing hikers and mountain bikes on the same trail increases the potential for accidents to occur. One thing is for certain there are two very vocal sides to this issue. This is brought to light just by the titles of three new recently published articles: Two Wheel Terrors; Hikers vs Bikers; and Outlaws in the Outback. The major emphasis of these articles was the "Danger" of mixing hikers and mountain bikes on the same trails. Examples of this perception include statements like "bicycles can be as intimidating as any 4-footed predator", "encountering new beasts on their trails", and "bicycles whooping and weaving as they descend" (Kita, 1986), provide a flavor of the content of these articles. Review of many articles referring to the danger of mountain bikes on hiker trails resulted in very limited data to support this opinion.

A study of whether mountain bikes should be allowed on hiking trails due to safety considerations was conducted on the Los Padres National Forest. The results of this study did show that mountain bikes did not represent a significant hazard to hikers using the same trail, despite strongly voiced concerns from some members of organized groups (Pettit and Conta, 1987).

It is obvious from the reviewed literature that more information on mountain bike use as well as the tools to monitor its impacts on trails and other uses is needed.

Social Concerns Associated with Mountain Biking

There are many considerations to take into account when evaluating the social concerns of mountain biking. The Recreational Opportunity Spectrum (ROS), trail location, length, and historic use patterns, along with the visitors experience level and expectation can dramatically change their perception of seeing a mountain bike or bikes on the trail. Anytime a "newcomer" (mountain bike) hits the scene, the traditional user will resist, especially if the traditional user perceives this area as their turf (Hain, 1987; Pettit and Conta, 1987). This does not mean that the "newcomer" is accepted or resisted by other users. It does mean that land managers need to be aware of the expectations of and type of visitors using a specific trail and involve those folks early in the decision making process.

In summary, very little has been done nationwide, and virtually nothing specific to the southern National Forests, to analyze the environmental, safety, and social concerns of mountain bikes on previously hiker only trails. The purpose of this project is to provide the evaluation criteria needed for land managers to effectively plan and manage mountain bike opportunities on previously hiker only trails, primarily in the Southern Appalachians.

CHAPTER III

METHODOLOGY

Introduction

This section will discuss the methodology involved in gathering the information needed to successfully complete this paper. Little has been done historically to evaluate the environmental, safety, and social concerns of mountain bikes on previously hiker trails. Therefore the evaluation criteria and evaluation forms created for this paper will need time to be verified. The monitoring program will continue for a period of 5 years, from 1990 to 1995. During this time the criteria established for each functional area (environmental, safety, and social) will be verified or modified. At that time the final product, a Field Pocket Guide, will be completed to assist land managers, primarily in the Southern Appalachians, in planning, implementing, and monitoring mountain bike opportunities on previously hiker only trails.

Planning and Inventory

In 1990 a Trails and Dispersed Recreation Plan was completed for the Pisgah Ranger District. A portion of this plan included a condition inventory of 320 miles of existing trails, which were primarily hiker only, and a survey of closed roads and old railroad grades which had the potential to provide multiple use trail opportunities. This provided an inventory base of over 450 miles. Each of these routes were analyzed for its suitability to accommodate different uses (hiker, horse, mountain bike). Over 200 miles of potential mountain bike trails were identified and allocated to this use. Thirteen trails totaling 43 miles that were previously hiker only and identified as having a high degree of concern for potential resource damage, safety or social considerations are scheduled to be monitored. This project has established the evaluation/monitoring forms required by the plan to begin this monitoring program.

Environmental Concerns Monitoring

A Trail Condition Monitoring Form (Appendix A) was developed to assist the land manager in the evaluation of current (base line) trail conditions and to assess the resource condition and how various uses are affecting it. This form was developed to be user-friendly and understandable to all levels of the organization. It's primary purpose is to document the condition and changes occurring to a specific trail in relation to the types of use, both authorized and unauthorized, that are occurring.

Monitoring points were established by the author to provide the specific site information required to make decisions and to monitor the past decisions relative to the types of multiple uses permitted on specific trails.

Thirteen trails requiring on-going monitoring (up to 5 years) were identified in the District Trails and Dispersed Recreation Plan. The decision to monitor these specific trails was based on the following criteria: (1) public scoping resulted in specific resource issues of multiple-use on the trail; (2) the trail assessment indicated that mountain bike use could be accommodated on the trail but verification was requested; (3) historic users were against allowing mountain bikes on "their" specific trail and were sure damage would occur.

These trails were then re-surveyed and the monitoring points identified and established on the ground. These points were located at known resource problem areas and locations identified on the survey as having a high potential for future damage resulting from multiple use (steep slopes, wet areas, crossings, etc.). The average trail has between 1-2 established resource monitoring points per mile.

Each monitoring point will be surveyed and photographed annually and the results documented on the Trail Condition Monitoring Form. The results from this monitoring will be used for the following: (1) verify that the decision made to allow mountain bike use was correct; (2) correct minor damage or relocate short sections of trail impacted by authorized use; (3) determine if unauthorized use is occurring and document damage resulting from that use; (4) modify the uses permitted on a trail where excessive resource damage is occurring, and cannot be corrected within District budget allocations; (5) verify that information requested on the Trail Condition Monitoring Form is user-friendly and provides the manager with the information needed to adequately manage their District trail program.

Safety Concern Monitoring

A Safety Monitoring Form for Multiple Use Trails (with instructions) and a Trail Visitor Accident and Complaint Documentation Form for incidents involving multiple use trails (Appendix B) were developed by the author to help the land manager access and monitor visitor safety on multiple use trails. These forms were developed to be user friendly and understandable to all levels of the organization. Their primary purpose is to allow the land manager to establish safety monitoring points which can be evaluated through the use of Trailhead Questionnaires and visitor complaints, thus reducing the extensive time required for employees to monitor safety on the ground.

Thirteen trails which require on-going monitoring (up to 5 years) were identified in the District trails and Dispersed recreation Plan. The decision to monitor visitor safety on these trails was based on the following criteria: (1) Public scoping resulted in specific safety issues of multiple use on the trail; (2) Potential safety concern areas were identified but the decision to accommodate multiple use was made with the stipulation that safety monitoring would occur; (3) Specific users were against allowing mountain bikes on "their" trail because of safety concerns.

The evaluation criteria established can monitor the degree of safety concern from any point on a trail. Using the factors of slope, tread, sight distance, and use in conjunction with a numerical ranking a degree of safety concern can be established (see Appendix B). Any area where a high safety factor is calculated will indicate the need to establish a monitoring point. These points are then photographed, cataloged and mapped and can be tracked through the trail visitor questionnaires and visitor complaint forms. The Complaint Documentation Form is then used to document complaints allowing the manager to: (1) verify areas of safety concern; (2) correct problem in areas of high incidents; (3) verify accuracy of evaluation criteria (complaints are being made in areas surveyed as low or moderate safety risk areas); (4) support multiple use decisions made; (5) modify multiple use decisions made, based on documented safety considerations.

Social Concern Monitoring

Trail visitor questionnaires (Appendix C) were developed to provide the local manager information regarding the type of visitors using the 13 trails identified for monitoring in the District Trails and Dispersed Recreation Plan, and their opinions and attitudes regarding multiple use (specifically mountain bike) trails. These questionnaires are also necessary to effectively monitor the visitor safety portion of this project.

Two questionnaires were developed. One was developed as a mail-out and to pass out at the Ranger Station and Campgrounds under permit by the Cradle of Forestry in America Interpretative Association. The second questionnaire is to be used at trailheads identified for monitoring in the District dispersed and trails Plan.

For the purpose of this study 100 mail-out questionnaires will be sent out annually from 1990-1995. The mail-out will be a random sample (every 5th person) of people who register at Davidson River or Lake Powhatan Campgrounds. Questionnaire boxes located at the trailheads identified to be monitored for social and safety concerns and will be maintained year-round. The mail-out questionnaire will also be available at the Pisgah Ranger Station year-round and Memorial day through Labor Day at Davidson River and Lake Powhatan Campgrounds. The results of these surveys will be included in the annual update of this project, submitted each year in February, until the pocket guide is completed.

These questionnaires were developed by the author to obtain the following types of information: (1) degree of trail use and experience wanted by the our customers; (2) time of day and season of the year various types of users visit the monitored trails; (3) percent of visitors who belong to an organized group and the trail activities that group promotes; (4) opinion on types of use permitted on trails and reasoning for opinion; (5) group size; (6) visitor demographics.

Questionnaire data were coded and entered into a Data General, FES 2000, program built by the author. All questionnaires received through 1995 will be entered into this program and the results included into the annual project update. Although 166 responses have been received to date, they do not include a primary use season; therefore, a summary of responses will not be included until February, 1992.

The breakdown of visitors sampled from November 18, 1990 through March 6, 1991 were as follows: (1) 100 random mail-out questionnaires, 10 returned (unknown address), and 37 returned (from 12 states) for a 41% response rate; (2) 42 completed and turned in at the Pisgah Ranger Station; (3) 87 completed and turned in at trailhead questionnaire boxes, for a total of 166 responses.

CHAPTER IV

DISCUSSION

Introduction

Mountain bikers like any other special interest group that depends on our public lands to participate in their recreational activity come from a wide range of social backgrounds. Because of these backgrounds their expectations and preferences to recreational opportunities and experience levels vary greatly. Much of the existing information on mountain biking indicates that open gravel or dirt roads, closed roads, and abandoned railroad grades provide the best opportunity for this activity. This is probably true for many mountain bikers but not true for all. The Recreational Opportunity Spectrum (ROS) talks about that wide range of opportunities varying from urban to primitive. By providing mountain bike opportunities only on open or closed road systems much of this spectrum would not be available for the mountain bike. The perception of a back country experience may be met by some on a closed road but probably not for the the backpacker who has taken up the sport of mountain biking. Realizing that all public land can not and should not be all things to all people, I believe we as land managers need to do a better job of providing the range of opportunities to mountain bikers where the possibilities exist. It is my hope that through this project many of the barriers and negative perceptions that many public land managers have toward the mountain bike can be reduced or eliminated.

Because the emphasis of this paper is on monitoring the environmental, safety, and social concerns/ effects of mountain bikes on previously hiker only trails the following discussion will be included under those topics.

Environmental Concerns

Historically, trails in the Southern Appalachians were developed as travelways for Indians and settlers as they traveled from one point to another, with no thoughts in mind for the scenic qualities, resource protection, or recreation. Trails were usually the shortest distance between two points, slope and vegetation type was normally not considered. Unfortunately, that trail system is providing many of the trail opportunities available for recreationists today.

Because of this condition many of our trails are improperly designed for the amount of use they currently receive, and require extensive maintenance, including constructed water bars, to keep them stabilized. With most of our trail maintenance being completed by volunteers who emphasize hiking, any damage resulting from other types of use is very controversial. This has resulted in a need to develop a environmental monitoring form which can also be used by our volunteers to monitor if resource damage is occurring by uses other than hiker. Involving these groups in the monitoring program has not only substantially reduced the agency person-power needed to complete the monitoring, but has also allowed the people doing the maintenance to see first hand the results of "other users on their trails". In most cases to date, resource damage caused by mountain bike use on previously hiker only trails has been minimal. In cases where damage by mountain bikes has been documented, the bikers had not followed the Mountain Bike Code of Ethics.

In most cases, I believe that the previously hiker-only trails that have been designated for mountain bike use will receive little or no resource damage as a result of this use. Any damage that does occur should be easily corrected through minor trail relocation or structure re-design (ex: log water bars replaced with out-sloping or sub-surface water bars).

Safety Concerns

In many cases a lack of understanding of the mountain bike and a perceived safety hazard of mountain bikes on hiker only trails has caused many land managers to become overly cautious in permitting mountain bike use. By developing and verifying the criteria to be used to determine areas of safety concern when authorizing multiple uses, providing recommendations on how to correct hazard areas, and promoting the "mountain bike code of ethics", I believe the degree of safety risk from multiple uses can be substantially reduced.

Visitor safety has always been and should be a primary concern of land managers. In the case of mountain bikes on hiking trails this concern has been emphasized heavily by much of the organized hiking community. I have personally been confronted by "hikers" saying: "if you let mountain bikes on my trail, you are going to be liable if anyone ever gets hurt"; "it's unsafe to mix hikers and mountain bikes"; and "are you nuts, everybody knows that mixing hikers and mountain bikes on the same trail is dangerous". These phrases or something similar are probably familiar to other land managers who are currently dealing with the mountain bike issue. I was almost convinced that mountain bikes were the most dangerous machine since the B-52 bomber. Then I started looking at all the places on the Pisgah Ranger District where mountain bikes had been riding before any planning was completed or restrictions or authorizations were made. Many of these trails received very high hiker use and not one accident or injury was reported.

Safety concerns associated with mountain bike use on previously hiker only trails will be monitored consistent with the guidelines identified in the methodology section of this report. It is my hope that at the completion of this monitoring program sufficient data will be available to adequately address the safety considerations associated with the mountain bike issue. This will provide land managers the tools necessary to make and monitor decisions based on established evaluation criteria rather than social pressures and opinions.

Social Concerns

Like any "new kid on the block" the mountain bike has been met with resistance. Historic and traditional visitors are reluctant to approve of this or any new use openly, and feel the need to protect "their special interest". Because of this ownership, I believe that before any decisions are made by land managers to permit multiple uses on previously hiker only trails, it is critical to solicit input and involve the current users into the evaluation process. The questionnaires developed for this project are essential for contacting the majority of users who never respond to public scoping letters. This silent majority are the folks who we as land managers rarely get feedback from and understanding their opinions, perceptions, and expectations of "their National Forest trails" is critical to providing the experiences they need.

The information gathered through the use of questionnaires developed for this project (Appendix C) will substantially increase the land managers knowledge of who is using a specific trail. By understanding the range of who is using the trail, why they are using the trail, and how they feel about other types of use on "their trail" will greatly help in planning multiple use trails. These questionnaires are also very important in monitoring previous decisions made on authorized trail uses and to inform the manager of problems or conflicts arising on a particular trail.

The questionnaires are also a critical part of the safety monitoring program. The last question on the field questionnaire deals with incidents, accidents, or near misses that have occurred. This will provide the manager with an early warnings system to detect safety problems and will provide the "silent majority" the opportunity to respond.

CHAPTER V

SUMMARY, RECOMMENDATIONS, CONCLUSIONS

Summary

This is the first year of a five year monitoring program to evaluate, verify, and/or modify the environmental, safety, and social concerns or effects of mountain bikes on previously hiker only trails. Through this process a pocket guide for planning and monitoring mountain bikes will be developed. The primary purpose of this guide is to provide land managers with the information necessary to plan and monitor mountain bike opportunities as well as deal with the issues of resource damage and safety. Although this study is being conducted for use by managers in the Southern Appalachians, the results should be beneficial to public agencies nationwide.

Recommendations

The recommendations section of this study will be compiled, verified, modified, and updated annually. In 1995 the final results of this study along with the "Pocket Guide for Planning and Monitoring Mountain Bike Opportunities, primarily on previously hiker trails, will be submitted to the Southern Region, Trails Coordinator, for review and disbursement.

The initial recommendations for planning and monitoring mountain bike opportunities on previously hiker only trails are as follows:

- * Inventory, survey, and catalog all existing and proposed trails and their ability to provide multiple use opportunities before making use allocations;
- * Implement public involvement early in the decision making process, ask their assistance in developing alternatives;
- * Review the ROS, look at the range of opportunities your area can provide and try to provide those opportunities to mountain bikers as well as hikers;
- * Disperse mountain bike use where possible (it's better to have 200 mountain bikes on 200 miles of trail rather than 200 bikes on 30 miles) to reduce conflict and minimize resource damage;
- * Involve your special interest groups in the monitoring process, solicit their input in developing and implementing the program (to let them see first hand what's happening);
- * If resource damage is occurring because of mountain bike use, request ideas from mountain bikers on possible mitigating measures then get them involved in correcting the problem;
- * Enforce all use allocation decisions made, or risk losing credibility with all involved groups/ concerned citizens, etc.
- * If monitoring results indicate that either for environmental, safety, or social concerns mountain bike use is not acceptable, then correct the problem or modify the decision.

Conclusions

The conclusions section of this study will be compiled, verified, modified, and updated annually. In 1995 the final results of this study along with the "Pocket Guide for Planning and Monitoring Mountain Bike Opportunities", primarily on previous hiker only trails, will be submitted to the Southern Region, Trails Coordinator, for review and disbursement.

The initial conclusions for planning and monitoring mountain bike opportunities on previously hiker only trails are as follows:

- * The resource and safety concerns associated with mountain bikes on previously hiker trails are greatly exaggerated;
- * Hiker and mountain bike use can be compatible on previously hiker only trails providing the evaluation criteria for resource and safety concerns (Appendix A and B) are met;
- * Disregard for the existing "mountain bike code of ethics" and lack of courtesy for other trail users, by a few bikers, has been the main cause of documented resource and safety incidents;
- * By authorizing mountain bike use on suitable hiking trails, we as land managers, can substantially increase the range of the Recreational Opportunity Spectrum available for mountain bikers and still maintain the quality of the recreational experience for hikers.

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APPENDIX A

TRAIL CONDITION MONITORING FORM

(Environmental Concern Monitoring)

TRAIL CONDITION MONITORING FORM

TRAIL NAME: _____ DATE: _____ TIME: _____

CURRENT WEATHER CONDITIONS: _____

TYPES OF PERMITTED USE: (hiker, horse, mountain bike) _____

SEASONAL RESTRICTIONS: YES NO EXPLAIN: _____

MONITORING POINT: (numerically with R= resource and S= safety _____ R
monitoring point. example: 1R, 2S, 3R, 4R etc)

LOCATION: (example: 1/4 mile east of trailhead. point identified by
red dot on base of popular tree. metal tag attached to dot) : _____

TYPE OF MONITORING POINT: (trailhead, tread depth or condition, surface or
gully erosion, stream crossing, structure condition, etc.)

- TREAD DEPTH: PRESENT DEPTH = _____ PREVIOUS (BASE DATA) = _____

- SURFACE EROSION VISIBLE: YES NO

- GULLY EROSION VISIBLE : YES NO

- STANDING WATER OR POOLS : YES NO

VISUAL OBSERVATIONS: (active surface or gully erosion, degree of erosion since
past visit, structure damage occurring from authorized or unauthorized use,
evidence of inappropriate trail ethics or use, etc.)

- IS RESOURCE DAMAGE OCCURRING FROM AUTHORIZED USE: YES NO

- TYPE OF DAMAGE: _____ DEGREE OF DAMAGE: L M H

- IS UNAUTHORIZED USE OCCURRING: YES NO TYPE _____

- IS RESOURCE DAMAGE OCCURRING FROM UNAUTHORIZED USE: YES NO

- TYPE OF DAMAGE: _____ DEGREE OF DAMAGE: L M H

- CAN THIS DAMAGE BE CORRECTED THROUGH ROUTINE TRAIL MAINTENANCE: YES NO

- ATTACH PHOTOS TO THE BACK OF THIS FORM, ALL PHOTOS SHOULD BE DATED.

APPENDIX B

SAFETY MONITORING FORM FOR MULTIPLE USE TRAILS

(Safety Concern Monitoring)

SAFETY MONITORING OF MOUNTAIN BIKE USE ON MULTI-USE TRAILS

The following is a list of factors and evaluation criteria which can be used to assist in evaluating safety factors when considering mountain bike use on multiple use trails. These factors should also be used to complete the attached "Safety Monitoring Form for Multiple Use Trails. Although I believe this evaluation can be used for all multiple use trail planning and monitoring only hiker and mountain bike trails have been evaluated for this project.

Explanation of symbols:

Slope

- S1= steep slope (greater than 20%)
- S2= easy slope (0-10%)
- S3= moderate slope (10%-20%)

Tread

- T1= smooth tread, no obstacles for 0'-100'
- T2= smooth tread, no obstacles for 100'-100 yards
- T3= smooth tread, no obstacles for more than 100 yards

Note: obstacles are considered to be rocks, stumps, roots, overgrown vegetation causing the trail to be less than 2' wide, and structures that would cause the bicyclist to slow down considerably.

Sight Distance

- D1= Open view of trail ahead for more than 200'
- D2= Open view of trail ahead for 50'-200'
- D3= Open view of trail ahead for less than 50'

Use

- | | |
|---------------------------|-----------------------------------------|
| U3= heavily used trail | Due to various factors such as season, |
| U2= moderately used trail | method of travel, permitted uses, ROS, |
| U1= lightly used trail | and LAC this criteria should be ranked |
| | by the local land manager. Criteria |
| | such as parties/ hour, mile or trip may |
| | be used to establish use if current |
| | indicators do not exist. |

Safety analysis:

Taking all four categories into consideration, a safety analysis can be acquired from any point on a trail. Simply add the sub numbers from all four categories to come up with a total. For example S2 + T3 + D1 + U3 = 9

Low safety factor= 4-6

Moderate safety factor = 7-9

High safety factor= 10-12

Note: If the monitoring point has a low or moderate safety ranking stop here. For high safety ranking take photos of the point and complete the Safety Monitoring Form.

SAFETY MONITORING FORM FOR MULTIPLE-USE TRAILS

TRAIL NAME: _____ DATE: _____

MONITORING POINT: (points established numerically on trail, _____
include S after number to indicate safety
monitoring point. Example 4S)

LOCATION: (example: 1/4 east of trailhead. point identified by a yellow dot
painted on poplar tree 2 ft. above ground, N side of tr. metal tag on
south side) _____

EVALUATION: SLOPE ____ + TREAD ____ + SIGHT DISTANCE ____ + USE ____ = ____ (10+)
(Note: use criteria factor numbers from previous page)

COMMENTS: _____

ACCIDENT OR COMPLAINT DOCUMENTATION FOR ESTABLISHED MONITORING POINT

DATE/ TIME	TYPE OF INCIDENT (COMPLAINT/ACCIDENT)	USERS INVOLVED H, MB, HORSE	CONTACT (NAME/ADD)	SOURCE OF INFORMATION
Example 11/24/90 1300	Complaint: hikers almost hit by speeding mountain bike. No injury.	12 hikers 4 mtn. bike	John Smith Phone Number City: State:	Questionnaire Ranger Station, Letter Phone Call

Additional Information: _____

FS EMPLOYEE: _____

APPENDIX C

TRAIL VISITOR QUESTIONNAIRES

(Social Concern Monitoring)



**Cradle of Forestry in America
Interpretive Association**

You can help the National Forests in North Carolina better manage your trails by taking a few minutes to answer this survey. We are trying to gauge what our visitors want from their trail system. Your responses will be used to determine what's working, and what needs improvement. Thanks for your help!

TRAILHEAD/ LOCATION: _____ DATE: _____ TIME: _____

What is your primary method of travel on Forest Service Trails: (circle)

Hiker Horse Mountain Bike (non-motorized)

Do you belong to a trail club or other outdoor organization: (circle) Yes No

Which of the following trail activities does your group participate in: (circle all that apply)

(a) Hike (b) Horse (c) Mtn Bike (D) Motor Bike

Do you believe that mountain bike and hiker use is compatible on the same trail: (circle) Yes No Comment:

Do you believe hiker and horse use is compatible on the same trail: (circle)

Yes No Comment:

Do you believe that hiker, horse, and mountain bike use is compatible on the same trail: (circle) Yes No Comment:

If you answered NO to any of the above 3 questions, on which of the following do you base your answer: (circle all that apply)

- Resource concerns (damage to trail) Yes No Unknown
- Social concerns (seeing mountain bikes or horses on the trail affects my experience): (circle) Yes No Unknown
- Safety concern (it is unsafe to mix hikers and mountain bikes or horses on trails): (circle) Yes No Unknown

In our effort to provide for visitor safety on this trail while promoting multiple use for hikers, horses and mountain bikers (non-motorized) on specific trails, it is important that any accidents or "close calls" between various users be reported. If an incident does occur please report it in person, by phone, or by writing, the Pisgah Ranger Station, 1001 Pisgah Highway, Pisgah Forest, NC. Phone: 704-877-3350.

How many people are in your group today: _____ Zip Code: _____

1002 Pisgah Highway • Pisgah Forest, North Carolina 28768 • (704) 884-5713, (704) 877-3265

A non-profit organization supporting educational programs of the USDA Forest Service

APPENDIX D

MOUNTAIN BIKE TRAIL PLANNING GUIDE (FSM)

Exhibit 1

Mountain Bike Trail Guide

	Easiest	More Difficult	Most Difficult ^{1/}
<u>Grade</u>			
Max. Pitch	10%	30%	+30%
Max. Sustained Pitch	5%	10%	15%
Length	100'	300'	500'
Turning Radius	6'	3'	2'
<u>Length of Trip</u>			
Day	10-20 mi	20-40 mi	40-50 mi
One-half Day	5-10 mi	15-20 mi	20-25 mi
<u>Clearing^{2/}</u>			
Width	48"+	36"-48"	36"
Height	8'	8'	Max. 8'
<u>Tread^{3/}</u>			
Width	24"+	12"-24"	12"
Surface	Relatively Smooth	Sections of Relatively Rough Surface	Varied--Some Portage Required

^{1/} Upper limit of grade and pitch length depends on soil type, amount of rock, vegetation type, and other conditions affecting stability of the trail surface.

^{2/} Curve alignment to avoid cutting large trees.

^{3/} Increase tread width 6 inches on switchbacks or where side slopes exceed 60 percent.

2.31c--2

TRAILS MANAGEMENT HANDBOOK

FSH 6/85

APPENDIX E

MOUNTAIN BIKE CODE OF ETHICS

MOUNTAIN BIKE CODE OF ETHICS

SAFETY AND COURTESY CODE

1. Wear a helmet, eye wear, and gloves. Carry a first aid kit and know how to use it.
2. Always ride with others in remote areas and leave word of your travel plans with someone.
3. Maintain control of the speed at all times and approach turns in anticipation of someone around the bend.
4. Dismount, yield, and be courteous when approaching all other trail users.
5. Greet hikers well in advance in a normal voice when approaching from behind.
6. Respect everyone's right to serenity - minimize noise.

ENVIRONMENTAL CODE

1. "Tread lightly" to avoid erosion. Carry bike over boggy or muddy areas.
2. Avoid skidding or spinning on steep grades. Carry your bike over stepping stones, water bars, and steps.
3. Stay on designated trails. Do not shortcut, switchback, or detour around fallen trees.
4. Don't litter. Pack-out what you pack-in, including litter left by others.
5. Help keep trails clear for others by removing newly fallen brush or limbs.
6. Keep pets under control. It's best to leave pets home.

This code of ethics was provided by the: Blue Ridge Bicycle Club, P.O. Box 309, Asheville, NC 28802.

APPENDIX F

ANNUAL MONITORING/SUMMARY UPDATE FORM

ANNUAL MONITORING SUMMARY/UPDATE FORM

199_

ENVIRONMENTAL CONDITION MONITORING SUMMARY

Total number of points monitored. _____

Total number of points where resource damage was documented. _____

Total number of points where resource damage resulted from authorized uses. _____

Total number of points where resource damage resulted from unauthorized uses. _____

Total number of points monitored where resource damage was corrected. _____

Total number of points monitored where resource damage could not be corrected through maintenance. _____

Total number of trail use designations modified because of damage. _____

SAFETY CONDITION MONITORING SUMMARY

Total number of points monitored. _____

Total number of documented incidents or accidents involving hikers and mountain bikes on trails where both uses are permitted. _____

Total number of trail use designations modified because of safety concerns. _____

SOCIAL CONDITION MONITORING SUMMARY (QUESTIONNAIRES)

Total number of questionnaires received. _____

- total number received from mail-out (100 sent) _____
- total number received from trailhead boxes, _____
- total number received from all other locations, _____

Number of respondents who's primary method of travel is: _____

- Hiking _____
- mountain biking _____

Number of respondents who believe hiker and mountain bike use is compatible on the same trail. _____

Number of respondents who believe hiker and mountain bike use is not compatible on the same trail. _____

- Because of resource concerns, _____
- Because of safety concerns, _____
- Because of social concerns, _____

Percent of respondents who support hiker and mountain bike use on the same trails _____